Introduction: The prevalence of sleep-disordered breathing (SDB) and obstructive sleep apnea (OSA) in pregnant women has been estimated to range from 12% to 26.7% (1,2,3). Previous studies have evaluated SDB and/or OSA during pregnancy, but no study has specifically examined the first postpartum day. The first-day postpartum is associated with significant changes to maternal physiology and sleep conditions. We have performed a prospective observational study among women during the first postpartum night to assess the prevalence of OSA and hypoxemia.

Methods: After approval from the local Ethics Committee, we monitored fifty-five women during the first postpartum night, to identify patients with OSA and hypoxemia (oxygen saturation < 90%). Consenting women were monitored with a Remmers sleep recorder. Oxygen saturation, heart rate, nasal airflow, snoring sound, and respiratory movements were recorded continuously. The data was uploaded to a computer and summarized with the Remmers Insight software (SagaTech Inc, Calgary). A respirologist with subspecialty sleep medicine training manually interpreted the generated reports according to American Academy of Sleep Medicine criteria. A diagnosis of OSA was based on 5 or more episodes of apnea or hypopnea per hour during sleep. Oximetry data and clinical information were recorded. Continuous variables were analyzed with analysis of variance. Fischer’s Exact Probability Test was used for comparison of categorical variables. The results are presented as mean +SD. Results with a p-value less than 0.05 were considered statistically significant.

Results: Seven patients (12.7%) have OSA by polysomnography criteria. Six of the 7 OSA patients had hypoxemia overnight. Five patients had hypoxemia but did not meet the polysomnography OSA criteria. Eleven (20%) of the 55 women in this study, had severe hypoxemia (oxygen saturation < 90%) during the first postpartum night. Compared to the normal subjects, the OSA subjects and the hypoxemic subjects had significantly lower mean oxygen saturation overnight, lower minimum oxygen saturation levels, and greater weight as well as BMI (Table). There was no respiratory arrest and none of the patients required assisted ventilation or endotracheal intubation. There was no significant difference in the anesthetic techniques or the frequencies of intrathecal
opioids received by the hypoxemic and non-hypoxemic patients.

**Discussion:** The 12.7% prevalence of OSA in the first postpartum night is consistent with the reported prevalence of OSA in the obstetric population during pregnancy (2,3). The 20% prevalence of hypoxemia (oxygen saturation < 90%) in the first postpartum night is greater than the prevalence of OSA in our patients. This indicates that OSA is not the only disorder associated with postpartum hypoxemia. OSA is more prevalent in pregnant women than non-pregnant women of similar age, and is associated with hypoxemia during sleep in the first postpartum night. Further studies are needed to identify the women at risk for hypoxemia, to assess the clinical courses of these women and to determine the clinical implications.

**References:**

1. Sleep. 2013 1;36:717-721B.
Introduction: Postpartum hemorrhage (PPH) is the leading cause of maternal mortality globally implying a considerable disease burden for our society. Canadian PPH rates increased by 22% from 2003 to 2011 (from 5.1% to 6.2%). Antenatal risk factors screening is crucial to identify women at high risk of developing PPH. However, a large proportion of women who presents with PPH do not have any identifiable risk. When it occurs, timely diagnosis is critical to set off appropriate interventions. Peripartum hysterectomy can be a life-saving intervention performed in women with PPH who might otherwise exsanguinate. Frequently, women have hemorrhaged by the time they undergo the procedure and lose significantly more blood during the hysterectomy itself. Massive Transfusion Protocols (MTP) were originally developed for trauma emergencies to provide blood transfusion to unstable patients in an immediate and sustained manner. The MTP is an effort to coordinate surgical, anesthesia, laboratory and blood bank teams and to address and monitor hemorrhage emergencies. The aim of this study was to define a tool to outline the “ideal” care during a MTP activation in an obstetric environment.

Methods: A multidisciplinary team at Sunnybrook Hospital Health Science represented by a hematologist, obstetrician, anesthetist, trauma surgeon, intensivist, nurse and blood bank technician was assembled. The team was required to set up a tool that would indicate a paramount quality of care during a Massive Transfusion Protocol (MTP) activation. Parameters were selected and set for each phase: activation, initiation, maintenance, and deactivation. The performance of each item was assumed to be essential to deem that the protocol goals were achieved.

Results: Table 1.

Discussion: To our knowledge, the current level of evidence on clinical impact of MTPs in obstetric practice is low (level of evidence 4). There are only two descriptive studies published in this population: a series of 3 cases and a descriptive report on 31 consecutive cases of MTP activation in obstetric settings. Apparently, current
development and implementation of MTP in obstetrics are relying on trauma literature. Our tool was constructed comprising both face and content validity. Hopefully, the tool suggested by this study will assist institutions to: 1) implement efficient MTP in obstetrics; 2) evaluate the quality of care provided when MTP is activated in obstetrics; and 3) assess adherence to protocol.

References:
Introduction: The Labor Pain Questionnaire (LPQ) is the first health-specific multidimensional psychometric instrument developed to measure women’s childbirth pain experiences. Once validated, the LPQ will allow interdisciplinary research to resolve existing controversies related to childbirth pain relief and build the scientific foundation required for evidence-based labor analgesia. We hypothesized that the LPQ would provide reliable measurement (ICC>0.7) in women in early labor without pain relief who reported minimal or no change in their pain over the course of the study. We further hypothesized that the LPQ would demonstrate sensitivity to change in women who reported clinically important changes in their pain.

Methods: Following REB approval and written informed consent, healthy ASA 1-2 laboring women with healthy term fetuses were recruited in early labor. All women were fluent in English, >18 years of age, < 6cm cervical dilatation, contracting > 3 minutes apart without pain relief. Women were randomized to answer the LPQ in Mixed versus Standard questionnaire format in two test sessions (Test 1, Test 2) separated by a 20-minute window. Versions of the LPQ differed only by the order of questions. Both test sessions were administered by the same trained interviewer. Additional questions included an 11 point numeric rating scale (NRS) for pain, verbal pain rating scale (VPRS) and Pain Mastery Scale (PMS) completed during each test session as part of validity testing. Changes in women's pain experiences over the course of the study were rated using the Patient Global Impression of Change Score (PGICS), permitting assessment of meaning of pain scores on the LPQ associated with each level of change in pain. Analyses: An apriori sample size estimation suggested 90 women were required to examine test-retest reliability. Intraclass correlation coefficients (ICC) were used to analyse the test-retest reliability of LPQ composite scores and subscale scores between first and second administrations of the LPQ. Raw
Scores were transformed to percentage scores to ensure even representation of subscale scores in composite LPQ scores.

**Results:** 104 women completed the study. Ninety-two reported no change or minimal change in their pain over the study based on the PGICS. Test-retest reliability for the LPQ and subscales were high (ICC, 0.84 to 0.98, p < 0.001, Table 1). Data from the 12 women who reported a clinically important change in their pain were used to assess the LPQ's sensitivity to change. Analyses demonstrated an effect size (ES) of 0.57 (moderate) and a Standardized Response Mean (SRM) of 1.29 (small). Correlations between average percentage scores for the LPQ and the NRS were strong for Test 1 and Test 2 respectively (r= 0.78 and 0.78, p< 0.001) and moderate for the PMS (Test 1 r= 0.58, Test 2 r= 0.661, p < 0.001) and VPRS (test 1, 0.58, Test 2 r=0.50 , p < 0.001).

**Discussion:** The LPQ and its subscales demonstrated high levels of reliability when used to assess women's experiences of childbirth pain during early labor without pain relief. Study findings also suggest that the instrument demonstrates sensitivity to change and convergent validity with commonly used pain tools in labor analgesia trials.

**References:**
1. Physical Therapy 2006 86: 1351-1359
Introduction: A significant risk factor for uterine atony is prolonged exposure to oxytocin during augmentation of labor, which results in the ‘desensitization’ phenomenon, a decrease in the response of the myometrium to further oxytocin.\(^{[1]}\) The importance of extracellular calcium is well-established in myometrial contractility,\(^{[2]}\) however, in the context of desensitized myometrium, its significance is unknown. We aimed to investigate the effect of low, normal and high extracellular calcium concentration on oxytocin-induced contractility, in desensitized human myometrium in-vitro.

Methods: After REB approval, and written informed consent from patients undergoing elective cesarean deliveries, this in-vitro experimental study was undertaken using myometrial tissue dissected into six strips. Each strip was mounted in a single organ bath with physiological salt solution (PSS) under homeostatic conditions and then pretreated for 2-hours with 10^{-5}M oxytocin (a model shown to achieve myometrial desensitization\(^{[3]}\)), or a control with 2-hours PSS pretreatment. Following pretreatment, the tissue was washed with PSS, and the calcium concentration was altered to reflect either low (1.25mM), normal (2.5mM) or high (3.75mM) levels, thereby providing 6 study groups. After equilibration in the desired calcium concentration, a dose-response to oxytocin 10^{-10}M to 10^{-5}M was performed. Contractile parameters were measured and compared among groups. The primary outcome was motility index (frequency x amplitude), and secondary outcomes included frequency, amplitude and area under the curve. A sample size of 32 strips per group was used (32 patients; 6 strips/experiments per patient), to detect a difference of 0.7-1.4 (0.25-0.35) g*contractions/10 min (sq root) in motility index (SE) between groups, with a 5% significance level and a power of 80%. Primary analysis will be undertaken with linear regression models adjusted for repeated measures through compound symmetry covariance structure.

Results: Results from 49 experiments (of a total of 192) have been analyzed. The control experiments show an increase in motility index of oxytocin-induced contractions from baseline when analyzed as a cumulative dose-response average, in the presence of 2.5mM calcium (538%), versus the 1.25mM (465%) and 3.75mM (341%) groups.
Similarly, the oxytocin desensitized groups showed higher motility index in the presence of 2.5mM calcium (462%), versus the 1.25mM (460%) and 3.75mM (173%) groups (Fig. 1). We plan to complete the study by April 2015 following further recruitment of 24 patients (providing 143 experiments, at a rate of 18 experiments per week).

**Discussion:** The results so far show that in both desensitized and non-desensitized myometrium, maintaining calcium levels at physiological levels (2.5mM), provides superior contractility. Hypercalcemia, in the setting of both non-desensitized and desensitized myometrium markedly attenuates contractility. Thus, after prolonged exposure to continuous oxytocin in labor augmentation, uterine atony and PPH could be attenuated by ensuring normocalcemia and preventing hypo- or hypercalcemia. Final analysis and discussion will be presented at the CAS meeting.

**References:**
2) Biol Reprod **1989**; 40: 942-948;
3) Anesthesiology **2013**; 119: 552-561
Introduction: Dilute concentrations of local anesthetic solutions combined with opioids are commonly used to provide epidural labour analgesia as they reduce motor block without compromising analgesia [1]. However, onset of analgesia can be delayed. The addition of a fentanyl bolus at initiation of labour epidural analgesia can speed onset [2]. A dose comparison study was conducted to investigate the onset of labour analgesia using 0.08% bupivacaine with varying doses of epidural fentanyl. We hypothesized that increasing doses of fentanyl (20, 50, or 100 mcg) would hasten the onset of labour analgesia.

Methods: Institutional REB approval was obtained. Written, informed consent was obtained from all patients participating in the study. A prospective, randomized, double-blinded, clinical trial of 105 women (ASA 1-2) at term gestation with singleton fetuses in early labour requesting epidural analgesia were enrolled in the trial. Each woman was randomly assigned to receive 20, 50, or 100 mcg epidural fentanyl with 10 mL of 0.08% bupivacaine. Maternal Numeric Rating Scale (NRS) pain scores were monitored for each contraction until pain scores were 3 or less, or for 30 minutes. The onset and duration of analgesia, maternal side effects, satisfaction, type of delivery, and fetal outcomes were also recorded.

Results: Data from 105 patients were analyzed. No losses to followup occurred. There was good balance between groups at baseline. The 50 and 100 mcg doses of fentanyl were associated with a faster development of NRS ≤ 3 compared to 20 mcg fentanyl (Table). Hazard Ratios [HR] for developing NRS ≤ 3 compared to the 20 mcg group: 2.1 [95% CI 1.2 to 3.5, P = 0.007] and 2.8 [95% CI 1.7 to 4.8, P < 0.001] for the 50 and 100 mcg groups respectively. The incidence of failure to reach NRS ≤ 3 within 30 minutes was higher in the 20 mcg group compared to both other groups. There were no
differences in adverse events between groups, except for a higher incidence of fetal bradycardia in the 50 and 100 mcg groups. However, Apgar scores were not significantly different between groups.

**Discussion:** Labouring parturients wish to have a rapid decrease in pain after the institution of epidural analgesia. We found that increasing doses of epidural fentanyl hastened the onset of analgesia without increasing maternal adverse events.

**References:**